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United States Patent [19]

Schiltz et al.

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[54] **PORTABLE, SELF-CONTAINED DATA COLLECTION SYSTEMS AND METHODS**

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[73] Assignee: **Entek Scientific Corporation**, Cincinnati, Ohio

[21] Appl. No.: **526,981**

[22] Filed: **Sep. 12, 1995**

[51] **Int. Cl.**[6] **G01H 11/00**

[52] **U.S. Cl.** **364/508**; 364/566; 364/709.09; 340/683; 73/570; 73/602

[58] **Field of Search** 364/508, 507, 364/566, 550, 551.01–551.02, 576, 479.19, 709.09, 708.1, 709.01, 413.02–413.06, 709.1, 709.11; 73/659, 660, 602, 579, 570; 434/266; 128/670, 700, 715, 701, 739; 381/51, 56, 57; 369/64, 63; 340/679, 680, 683, 682

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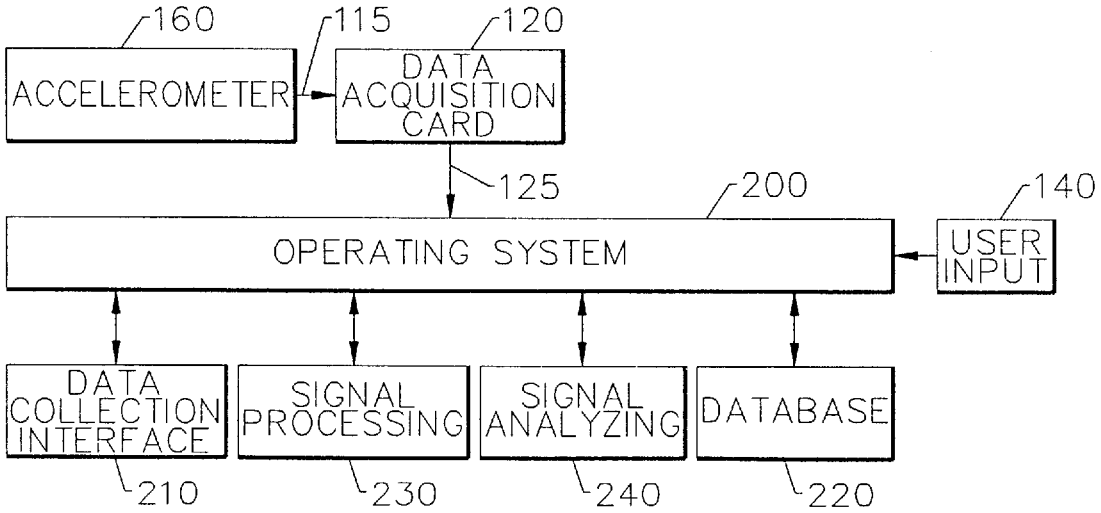
[57] **ABSTRACT**

A portable self-contained data collection system for measuring and collecting vibration data from machines includes an accelerometer which is coupled to the analog input of a data acquisition card. The data acquisition card samples and digitizes the analog signal to produce a time domain digital signal. The data acquisition card output is coupled to a battery-powered portable computer. The battery-powered portable computer includes a database having machine identifications and associated measurement parameters. The portable computer processes the time domain digital signal according to the measurement parameters associated with a selected machine identification, and produces a frequency domain digital signal by performing a Fast Fourier Transform and other digital signal processing operations. The frequency domain signal is also analyzed in the portable computer to produce predictive maintenance information. A power supply for supplying power to the accelerometer is also included. The accelerometer power supply electrically and mechanically couples the accelerometer to the data acquisition card. It supplies power to the accelerometer when the data acquisition card is activated.

12 Claims, 7 Drawing Sheets



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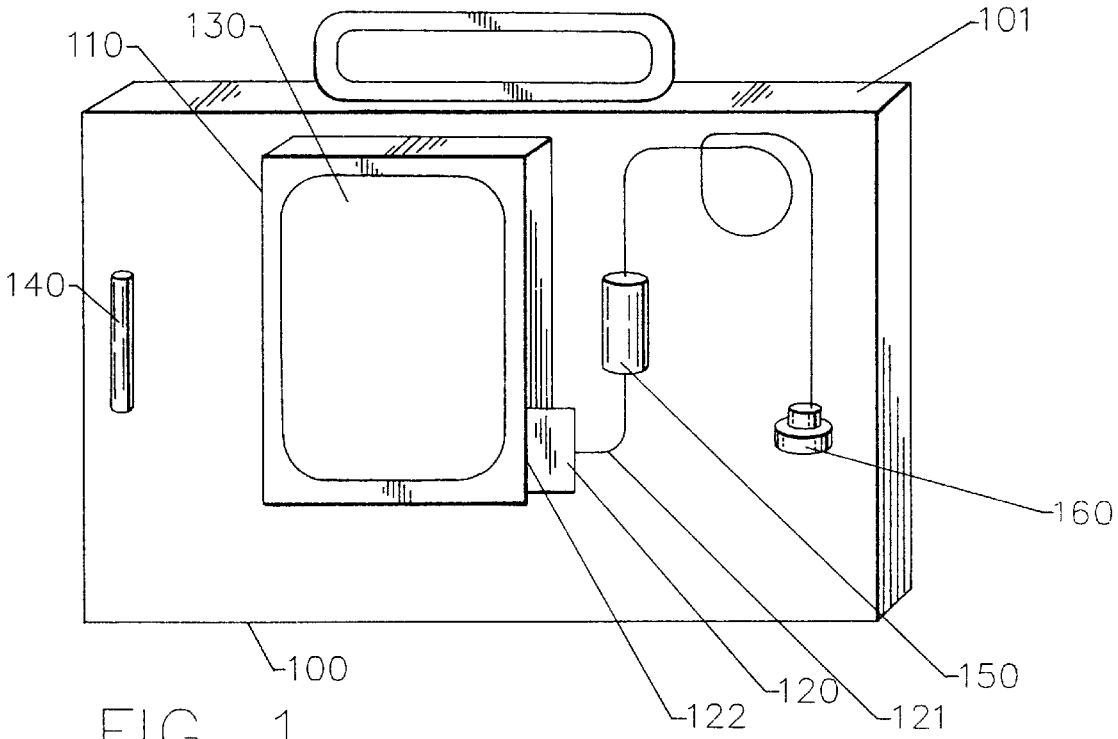

FIG. 1.

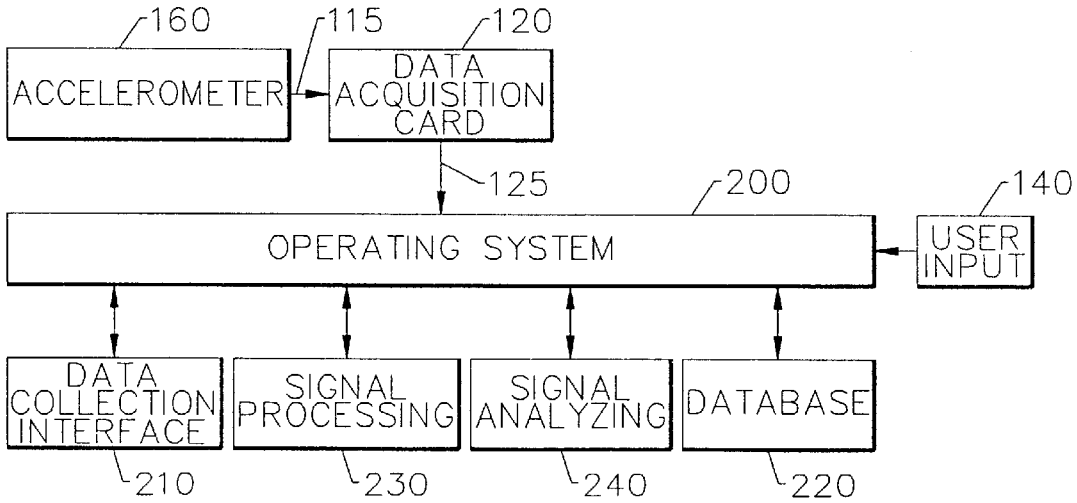

FIG. 2.

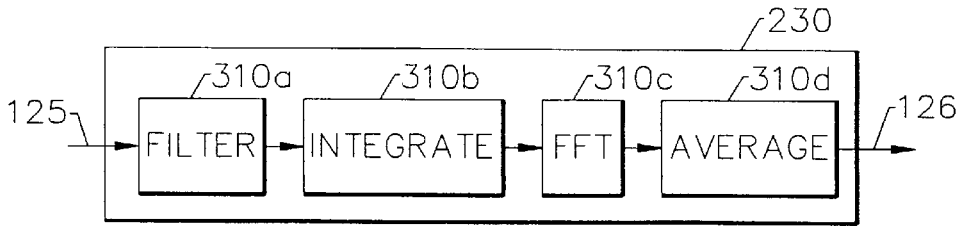

FIG. 3.

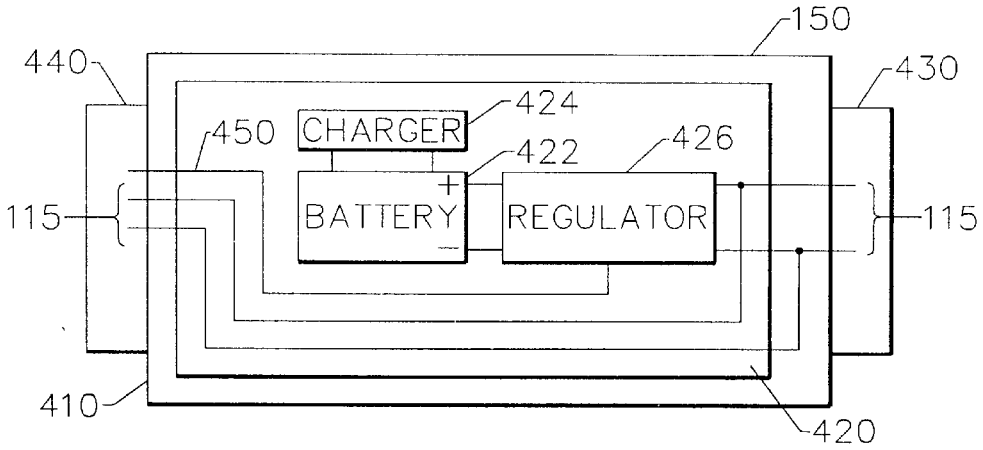

FIG. 4.

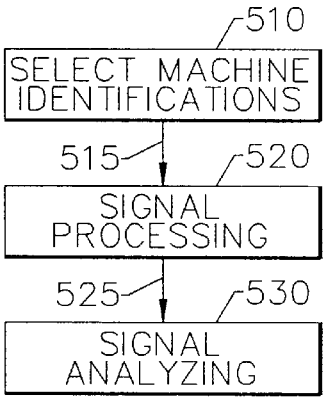

FIG. 5a.

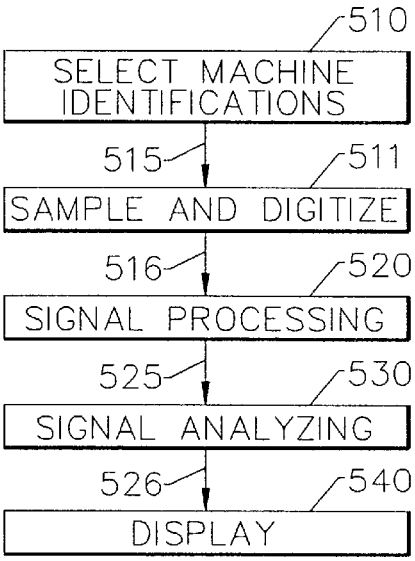

FIG. 5b.

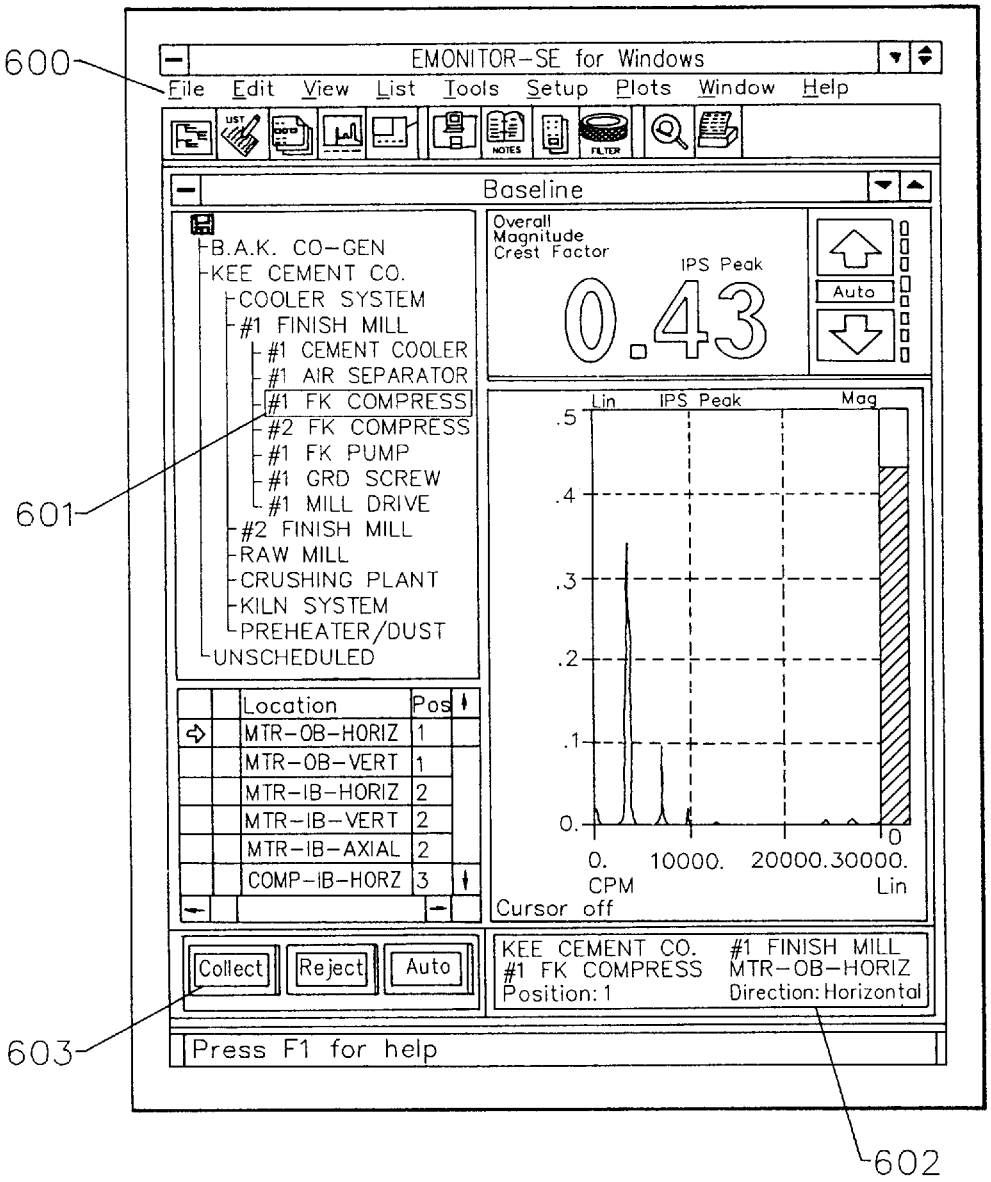

FIG. 6a.

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